REMARKS

1. Specification Objection - Title

The Examiner objected to the title as not being descriptive. Applicants have herein proposed a new title of "System And Method For Providing Real Time Control Of Peripheral Devices." Applicants submit that the new title has addressed the Examiner's concerns. Applicants respectfully submit that the objection to the title has been overcome.

2. Claims Rejections - 35 U.S.C. §102(e) – Claims 1-34

Claims 1-34 are pending in the present application, and were rejected in the Office Action dated April 7, 2004, under 35 U.S.C. §102(e) as being anticipated by Laity (U.S. Patent No. 2,251,112). Applicants respectfully traverse this rejection. Claims 1, 12, 19, and 24 are independent claims. Claims 2-11 depend from independent claim 1; claims 13-18 depend from independent claim 12; claims 20-23 depend from independent claim 19; and claims 25-34 depend from independent claim 24. For brevity, only the bases for the rejection of the independent claims are traversed in detail on the understanding that dependent claims are also patentably distinct over the prior art as they depend directly from their respective independent claims. Nevertheless, the dependent claims include additional features that, in combination with those of the independent claims, provide further, separate, and independent bases for patentability.

The Examiner has stated that Laity anticipates the claimed invention (i.e., includes each and every element of claims 1-34). However, the Laity reference is *specifically* directed towards a *port expansion system* that merely includes a protocol translator, and does not include any type of control system, let alone a real time controller. In contrast, the claimed invention is directed towards a *generic device controller unit* that interfaces between a processor and any number of generic peripheral devices, thereby enabling *true real time control of the generic peripheral devices in a non-real time computing environment.*

The Examiner has taken the position that Laity teaches a generic device controller unit system for facilitating interaction between a processor and any number of peripheral devices. Specifically, the generic device controller unit system, as claimed, includes:

(1) a general purpose device controller employing true real time peripheral device control, wherein the device controller interfaces between a non-true real time operating system and the peripheral devices, thereby allowing a non-true real time operating system to implement true real time control of the peripheral devices; and

(2) a data and protocol communications interface, wherein the communications interface connects the processor and the peripheral devices, thereby allowing the processor to utilize a single protocol and associated data to communicate with the peripheral devices which may be utilizing protocols and associated data which are different than that used by the processor.

While the Laity reference does appear to relate to an interface that allows a single communication protocol (USB) to be translated into several different communication protocols (serials ports, parallel ports, RY45, RJ11, and the like), *the Laity reference is absolutely silent, and therefore utterly lacking, in any disclosure relating to enabling a "non-true real time operating system to implement true real time control of the peripheral devices,"* as recited in the claimed invention.

In this regard, the Laity reference is specifically directed towards a *port expansion system* that merely allows a user of a personal computer to connect to peripheral devices that utilize various protocols. In contrast, the claimed invention is directed towards a *generic device controller unit* that interfaces between a non-true real time operating system (such as a personal computer running a general-purpose operating system) and one or more generic peripheral devices, and enables true real time control of the generic peripheral devices to be implemented in a non-real time computing environment. Indeed, the Laity reference does not even include the words, "real time," in its disclosure. To the contrary, the claimed invention is clearly described as a generic device controller unit that enables generic peripheral devices to be controlled in "true real time." A real time operating system is a highly deterministic operating system that

guarantees an application a specific response time to specific stimuli. The response must be returned within some small upper limit of response time, typically at the milli-second or micro-second level, or failure is said to have occurred.

The ability to enable true real time control of generic peripheral devices is highly important in many situations. Take for example, the control of mechanical reels in gaming machines. Since mechanical reels spin at very high rotational speeds (so that players cannot visually track the exact movements of the gaming icons), and since mechanical reels are also of a substantial size in diameter, the timing capabilities required to accurately stop the correct gaming symbol of a mechanical reel on the payline of a gaming window are extremely precise (i.e., a true real time operative level). Otherwise, the mechanical reels could not be stopped precisely enough to display the proper symbols along the payline. Traditional desktop computers do not employ true real time operating systems, but rather utilize general-purpose operating systems that are not capable of operating at this level of sensitivity.

For example, Windows NT (a general purpose operating system) is generally thought to be accurate to around 200 milliseconds (0.0200 sec); however, it may take up to 500 milliseconds to respond. In this manner, a general-purpose operating system may have the ability to provide very fast response times some of the time, but is not as deterministic (uniformly predictable) as required by a true real-time system. *True real time systems have much tighter time requirements and virtually no tolerance for unintended latencies.* If a mechanical reel is not stopped at the proper time interval but instead experiences a delay (latency) of only a tiny fraction of a second, a million dollar prize (or more) could be awarded that was not supposed to be awarded. These types of latency "failures" could cost casinos a tremendous amount of money, as well as running afoul with gaming regulations. Obviously, this is an unacceptable situation, and typifies the need for a true real time control in such a system.

Specifically, a mechanical reel typically spins at a rate of 60 cycles per second and contains 22 position stops on the outside of each reel. That translates into a time interval in the microseconds (approximately 0.00076 seconds per stop position) in which a command must be carried out in order to ensure that a mechanical reel is halted at the correct stop position. Additionally, in typically

gaming software that is used for communication between gaming machines and slot accounting and monitoring systems, the accounting and monitoring systems poll (i.e., make data requests of) the gaming machines in 40 millisecond (0.0040) intervals, and require responses from the gaming machines in 20 millisecond (0.0020) intervals. In such an accounting and monitoring system, if a poll response is missed, then the gaming machine is dropped from the system. Accordingly, such systems require true real time control in order to ensure proper polling responses.

Usually, the ability to provide real time control requires a specialized real time operating system that has a real time kernel and/or an embedded system. (An embedded system is a special-purpose computer system built into a larger device. An embedded system is typically required to meet very different requirements than a general-purpose personal computer.) This is a very specialized type of system. Advantageously, the claimed invention of the present application enables a standard (non-true real time) operation system to exercise real time control over peripheral devices, such as those described above, which require real time control, without the need for a specialized true real time operating system.

Many peripheral devices operate satisfactorily at greatly relaxed standards and merely appear to be operating in real time. However, this is not actually true real time, and therefore, the Laity reference is not capable of enabling a non-true real time operating system (such as a personal computer) to support peripheral devices that require true real time control. To the contrary, the generic device controller unit of the claimed invention interfaces between a non-true real time operating system (such as a personal computer) and one or more generic peripheral devices, and enables *true real time control* of the generic peripheral devices to be implemented in a non-real time computing environment. Thus, the Laity reference does not teach or suggest the "true real time" control of a "generic peripheral device" as recited in the claimed invention. Accordingly, Applicants respectfully submit that the 35 U.S.C. § 102(e) rejection of claims 1-34 as unpatentable over Laity has been overcome.

CONCLUSION

Applicants have made an earnest and bona fide effort to clarify the issues before the Examiner and to place this case in condition for allowance. In view of the foregoing discussions, it is clear that the differences between the claimed invention and the prior art are such that the claimed invention is patentably distinct over the prior art. Therefore, consideration and allowance of claims 1-34 is believed to be in order, and an early Notice of Allowance to this effect is respectfully requested. If the Examiner should have any questions concerning the foregoing, the Examiner is invited to telephone the undersigned attorney at (310) 712-8319. The undersigned attorney can normally be reached Monday through Friday from about 9:30 AM to 6:30 PM Pacific Time.

Respectfully submitted,

Dated: 8/24/04

Brooke W. Quist
Reg. No. 45,030
Attorney for Applicant
BROWN RAYSMAN MILLSTEIN
FELDER & STEINER LLP
1880 Century Park East, Suite 711
Los Angeles, CA 90067
(310) 712-8319